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PATENT  
Docket No. 5100-000005/US

IN THE U.S. PATENT AND TRADEMARK OFFICE

Applicant(s): Trygve HÅLAND et al.  
Int'l Application No.: PCT/EP03/02303  
Application No.: **NEW APPLICATION**  
Filed: September 7, 2004  
For: **DEVICE AND METHOD FOR TREATING A GAS/LIQUID MIXTURE**

**LETTER**

**MAIL STOP PCT APPLICATION**  
COMMISSIONER FOR PATENTS  
P.O. BOX 1450  
Alexandria, Virginia 22313-1450

September 7, 2004

Sir:

Amended sheets are attached hereto (which correspond to Article 19 amendments), as required by 35 U.S.C. § 371(c)(3). The Article 19 amended sheets are incorporated in the included Preliminary Amendment.

Respectfully submitted,

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international patent application PCT/EP03/02303

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EPO - DG 1

CLAIMS

17. 08. 2003

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1. Device for treating a gas/liquid mixture,  
comprising:

- an upright vessel with a lower and upper  
compartment;

5 - an inlet for admitting the flow of mixture into the  
lower compartment;

- an agglomerating unit placed between the lower and  
upper compartment for enlarging the liquid droplets in the  
mixture;

10 - a separator arranged in the upper compartment  
downstream of the agglomerating unit for further separating  
the mixture into a substantially liquid-containing mixture  
part and a substantially gas-containing mixture part.

- a lower outlet for discharging the substantially  
15 liquid-containing mixture part from the lower compartment;

- an upper outlet for discharging the substantially  
gas-containing mixture part from the upper compartment;  
characterized by

- collecting means for collecting in or downstream  
20 the agglomerating unit the liquid droplets which have broken  
through the agglomerating unit;

- recycling means for recycling the collected liquid  
from the collecting means to the lower compartment.

25 2. Device for treating a gas/liquid mixture,  
comprising:

- an upright vessel with a lower and upper compartment;  
- an inlet for admitting the flow of mixture into the  
lower compartment;

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- an agglomerating unit placed between the lower and upper compartment for enlarging the liquid droplets in the mixture;

- a lower outlet for discharging the substantially liquid-containing mixture part from the lower compartment;

- an upper outlet for discharging the substantially gas-containing mixture part from the upper compartment; characterized by

- collecting means for collecting on the downstream side of the agglomerating unit liquid droplets which have broken through the agglomerating unit;

- recycling means for recycling the collected liquid to the lower compartment from the collecting means.

3. Device according to claim 1 or 2, wherein the agglomerating unit comprises a wire mesh.

4. Device as claimed in any of the claims 1-3, wherein the collecting means comprise at least one collecting reservoir extending in the agglomerating unit for collecting the broken-through liquid therein, and wherein recycling means comprise a discharge conduit extending from the collecting reservoir to below the level of the liquid collected in the lower compartment.

5. Device as claimed in claim 1 or 2, wherein the collecting means are arranged over substantially 15% of the cross-section of the vessel.

6. Device as claimed in either of the foregoing claims 3-5, wherein the mesh is embodied to allow the supplied liquid to break through from a minimum K-value of about 0.1.

7. Device as claimed in any of the foregoing claims, wherein the agglomerating unit extends substantially horizontally.

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8. Device as claimed in any of the foregoing claims, wherein the agglomerating unit extends over substantially the whole cross-section of the upright column.

9. Device as claimed in any of the foregoing claims, wherein the thickness of the agglomerating unit is substantially constant.

10. Device as claimed in claim 1, wherein the separator comprises one or more cyclone separators.

11. Device as claimed in claim 1 or 10, wherein the separator comprises one or more axial recycle cyclones, the liquid discharge of which extends from the separator to below the liquid level in the lower compartment.

12. Device as claimed in any of the foregoing claims, wherein the inlet is connected to a pre-treatment unit for carrying out a first liquid/gas separation, which pre-treatment unit comprises an inlet cyclone separator arranged in the lower compartment.

13. Method for treating a gas/liquid mixture in an upright vessel with a lower and upper compartment, comprising of:

~~feeding the gas/liquid flow into the lower~~  
compartment of the column;

- guiding the gas/liquid flow through an agglomerating unit arranged between the lower and upper compartment at high speed such that liquid breaks through to a position beyond the downstream surface of the agglomerating unit;

- collecting the broken-through liquid;  
- recycling the collected liquid to the lower compartment;

- guiding the mixture through a separator in the upper compartment for further separating the mixture into a

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substantially liquid-containing mixture part and a substantially gas-containing mixture part;

- discharging the mixture from the lower compartment and discharging the mixture from the upper compartment.

5           14. Method for treating a gas/liquid mixture in an upright vessel with a lower and upper compartment, comprising of:

- feeding the gas/liquid flow into the lower compartment of the column;

10           - guiding the gas/liquid flow through an agglomerating unit arranged between the lower and upper compartment at high speed such that liquid breaks through to a position beyond the downstream surface of the agglomerating unit;

15           - collecting the broken-through liquid;  
- recycling the collected liquid to the lower compartment;

- discharging the mixture from the lower compartment;  
- discharging the mixture from the upper compartment.

20           15. Method as claimed in claim 13 or 14, wherein the K-value of the supplied mixture amounts to at least 0.1

16. Method as claimed in claim 13, 14 or 15, comprising of further separating the mixture in the upper compartment by guiding the mixture through one or more  
25 cyclone separators and carrying the separated liquid part to the lower compartment and the separated gas part to the upper outlet.

17. Method as claimed in any of the claims 13-16, comprising of pre-treating the introduced gas/liquid flow for  
30 separating a part of the liquid from the gas/liquid mixture, wherein the pretreatment comprises of guiding the introduced gas/liquid mixture through one or more inlet cyclones.

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18. Method as claimed in any of the claims 13-17, to be performed in a device as claimed in any of the claims 1-12.

19. Device or method as claimed in any of the foregoing claims, wherein the liquid contains oil and/or water.

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